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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/623,040	08/25/2000	Hiroshi Akiyama	NIP 188	5617

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EXAMINER

SOUW, BERNARD E

ART UNIT PAPER NUMBER

2881

DATE MAILED: 06/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/623,040

Applicant(s)

AKIYAMA ET AL.

Examiner

Bernard E Souw

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Pre-Amendment B (Paper # 6/B).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Preliminary Amendments

1. The Preliminary Amendment A, filed 03/28/02, Paper No. 4/A, has been entered. Claim 8 has been amended.

2. The Preliminary Amendment B, Paper No. 6/B, received 11/05/2002, was entered on 02/11/2003, i.e., **after** the first Office Action (Paper No.5) has been mailed on 01/11/2003.

Claims 9 and 10 have been canceled, and claim 4 has been amended.

Therefore, claims 1-8 are pending in this Office Action.

3. This Office Action supersedes the previous Office Action (Paper No.5), which is herewith declared as void.

Priority

4. This application is claiming the benefit under 35 U.S.C. 119(a)-(d) or (f) of an International Application PCT/JP99/05250 filed 27 September 1999 in Japan.

Information Disclosure Statement

5. The information disclosure statement filed 08/25/2000 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because no English translation is

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provided. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Drawings

6. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, In Fig. 1 & 7 the electrical connection to the AC-DC converter 272a from a power source (not shown) over transformer 271, as recited in the specification on pg.21-22, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

7. The disclosure is objected to because of the following informalities: On page 11 lines 6 and 12, the wording "*electromagnet devices 25 and 26*" should better read "*electromagnet **control** devices 25 and 26*", as correctly recited in lines 5 and 19.

Appropriate correction is required.

8. The disclosure is objected to because of the following informalities: On too many pages the wording "*by the way*" is being too excessively used. The wording should be used only to interrupt mainstream discussion by a different subject matter. Otherwise the wording may simply be omitted. Furthermore, a new paragraph should never be started with "*by the way*".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 (Amended) recites the limitation "PWM scheme" in line 4. There is insufficient antecedent basis for this limitation in the claim. The acronym "PWM" is not previously defined, neither in the parent/preceding claim(s), nor in the specification.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (USPAT # 6,410,929 B1) in view of Robertson et al. (USPAT # 4,421,988), and Takegami (USPAT # 6,346,773 B1).

11. Regarding claim 1, Nakamura et al. disclose a charged particle beam (CPB) irradiation equipment, as shown in Fig.3 and recited in Col.1/ll.24-35, for applying a CPB 13 and/or 18a to an irradiation area 19, comprising a scanning electromagnet 17 for deflecting the CPB 13, and a power supply 10 (also shown in Fig.1 and Fig.4), as disclosed in Col. 2/ll.1-5. However, Nakamura's power supply 10 is not used to apply a voltage to the scanning electromagnet 17, although Nakamura's scanning electromagnet 17 must inherently have a power supply for deflecting or scanning, the CPB conventionally in the X (horizontal or row) and Y (vertical or column) directions, respectively, as known in the art and implicated in Col.1/ll.57-67.

Robertson et al. disclose a CPB apparatus shown in Fig.1 equipped with horizontal scanning device 42 and vertical scanning device 42 shown in more details in Fig.2, as recited in Col.4/ll.25-53, generating X scan and Y scan signals as shown in Fig.5 and forming a scan pattern shown in Fig.3, as recited in Col.4/ll.54-56. As shown in Fig.5, Robertson's X-scan signal is a periodic but continuously scanning (i.e., saw tooth) signal, whereas the Y-scan signal is a stepwise (or step like) scanning signal.

However, neither Robertson's nor Nakamura's uses two separate power supplies, one equipped with filter and the other without filter, to generate the X (row) and Y (column) deflection signals.

Takegami discloses an electron beam imaging apparatus & method equipped with electron beam deflecting elements consisting a row selective circuit 312 and a column selective circuit 314, as shown in Fig. 18 and recited in Col.34/ll.12-15, row circuit 312 shown in more detail in Fig.19A being energized by a first power supply 311, and column circuit 314 by a second power supply 313, as recited in Col.34/ll.57-62, characterized in that the first (row scan) power supply 311 having no filter, as recited in Col.34/ll.37-46, and the second (column scan) power supply 313 shown in Fig.20 having a filter 402, as disclosed in Col.34/ll.28-37 (*attention: misprints!*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Nakamura's electromagnets in place of Robertson's electrostatic scanning plates to deflect the CPB, since both deflecting methods are conventional and well known in the art, such that a particular choice between the two is essentially a mere matter of design choice or preference that only involves routine skill in the art, and hence, unpatentable.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a filter in the second power supply for slowly varying column or Y scan signal, in order to cut off high frequency components in the scan signal output from the control circuit, as suggested by Takegami in Col.34/ll.38-41, but no filter in the first power supply for the row scan signal, in order to have a fast response in the row scan signal, as generally known in the art.

Although Takegami's filtered/unfiltered power supply is not used for CPB deflection, it is the teaching that is here relevant, i.e., that, similar to Takegami's row &

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column selection, any equivalent X-Y scan is implemented using one slowly varying signal (conventionally the Y scan) and one rapidly varying signal (conventionally the X scan), thus requiring the same filtered and unfiltered power supply as taught by Takegami. In this regard, how to make a power supply with and without filter is well known in the art, and does not need to be taught by any prior art.

Nakamura et al. and Robertson et al. may have used the CPB for a purpose different than Applicant. However, Applicant's differing purpose does not alter the conclusion that Applicant's use of a prior art device (Nakamura's as modified by Robertson's) having two separate power supplies, one having a filter for the column scan and the other without filter for the row scan, would be *prima facie* obvious from the purpose disclosed in the reference. *In re Lintner*, 173 USPQ 560.

Additional motivations in case the claims are interpreted in light of the specification:

It would have been also obvious to one of ordinary skill in the art at the time the invention was made to modify Robertson's saw tooth X-scan signal into also a step-wise/like signal, as readily implicated by Robertson in the Y-scan signal, since saw-tooth and step-like signals are both conventional and equivalently applicable for scanning or deflecting charge particle beams, as expressly disclosed by Miyama et al. (USPAT # 4,812,716) as recited in Col.2/ll.49-55, by Tomii et al. (USPAT # 4,939,413) as recited in Col.2/ll.55-61, and by Kobori et al. (USPAT # 5,786,669) as recited in Col.8/ll.52-57.

It would have been further obvious to one of ordinary skill in the art at the time the invention was made to choose a step-like signal to scan or deflect a charged particle

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beam, since this enables linearity correction, as taught by Timmermans et al. (USPAT # 4,551,655), as shown in Fig.2 and recited in Col.1/II.58-65 and Col.6/II.64-66.

12. Claim 4 recites the same limitations as claim 1, except the additional recitations of a first and second *inverters* being connected in series with the scanning electromagnet, and the DC (low pass) filter connected to the second inverter in parallel.

Nakamura et al. use an inverter 37 to transform a low voltage to a higher voltage, as recited in Col.5/II.1-13.

Applied to Nakamura's as modified by Robertson's, Takegami's modification of the Y deflection means employs a DC (low pass) filter parallel to the inverter output (instead of originally the power supply output).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Nakamura's inverter in Robertson's modification of the CPB deflection circuit, i.e., between the first and second power sources and the row and column deflection (scan) circuits, respectively, in order to be independent from the limitation of the respective power supplies, as suggested by Nakamura.

13. The limitations of claim 2 recite in a complicated but well known manner the step of scanning the electron beam in X & Y directions using computer controlled electronics, which trivially and conventionally makes use of voltage commands and electromagnet exciting currents, in which the computer calculates the required voltage command, the X-Y scanning being performed such that a full row scan is performed while the column

position being held constant. These limitations are all conventional and well known in the art.

Note, the claim language does not include any limitation regarding simultaneous application of a combined filtered and unfiltered outputs on a single beam deflector element, so Takegami's scan method is directly applicable to Nakamura's, the latter having been already modified by Robertson's.

In anticipation of Applicant's amendment of the claim(s), a combination of filtered and unfiltered power to excite *each* beam deflector would have been by all means obvious to one of ordinary skill in the art, for being conventional and well known in the art. A possible motivation is, e.g., to have a free choice between two known alternatives of performing a 2-dimensional scan on a body, i.e., by rapid horizontal scans over slowly varying vertical positions, or by rapid vertical scans over slowly varying horizontal positions.

14. The limitations of claim 5 consist of a combination of claims 1, 2 and 4, all having been rejected above. Therefore, claim 5 is rejected by the same token over the same prior arts.

15. Claim 3 recites includes all the limitations of claim 2, additionally characterizing and detailing the stopping of the output of the first power supply over the control device, when the transit time elapsed after the control device outputted the voltage command to the first power supply unit. These limitations are rendered obvious by Nakamura et al.

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in Col.5/ll.13-21. Hence, claim 3 is rejected over the same prior arts as previously applied to the parent claim 2.

16. Claim 6 recites the limitations of claims 3 and 5 combined, both having been previously rejected. Claim 6 is therefore rejected for the same reasons and over the same prior arts as claims 3 and 5.

17. Claim 7 recites limitations on means for detecting the electromagnet current and performing the X-Y scan, which are all trivial for being conventional and well known in the art. Therefore claim 7 is rejected for the same reasons and over the same prior arts as its parent base claim 5, for failing to recite any new and/or unique device part and/or process step that would distinguish the claim from those of claim 5.

18. Insofar the Examiner can ascertain beyond the above rejection under the second paragraph of 35 U.S.C. 112, claim 8 is also rejected as being unpatentable over Nakamura et al. in view of Robertson et al. and Takegami.

Fully independent from the indefinite terminology "PWM scheme", the limitation that the second control means controls the second inverter is already part of claim 5 (lines5-6). Applicant is advised to cancel this claim, in the event that a "PWM scheme" is not a critical feature in the claim.

Double Patenting

19. Claims 1-8 of this application conflict with claims 1-8 of the copending Application No. 10/287,656 filed on 11/05/2002 by the same Applicant. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

Statutory Type Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

20. Claims 1-3 and 5-7 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-3 and 5-7 of copending Application No.10/287,656. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Obviousness Type Double Patenting – No Secondary Reference(s)

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

21. Claims 4 and 8 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 4 and 8 of copending Application No. 10/287,656. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

► Although the wording has been slightly changed per Pre-Amendment A (Paper No. 4/A), claim 4 of the current application recites practically the same limitations as claim 4 of the copending Application No. 10/287,656.

► Claim 8 of the current application is essentially the same as claim 8 of the copending Application No. 10/287,656, except for its dependency to *anyone of claim 5 to claim 7*, instead of to claim 5 alone.

The above rejections are provisional obviousness-type double patenting rejections because the conflicting claims have not in fact been patented.


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22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 703 305 0149. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes
May 30, 2003



JOHN R. LEE
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